

GGY 4031
LECTURE NOTES 7b
AEOLIAN DEPOSITS

AEOLIAN DEPOSITS AND ENVIRONMENT

- **Aeolian** processes are those involving transport and deposition of material by wind.
- **Define WIND/AIR? What is the difference between the two?**
- Aeolian environments are those in which the deposits are made up mainly of wind-blown material.
- Most obvious aeolian environments are the large sandy deserts in hot, dry areas of continents

AEOLIAN DEPOSITS AND ENVIRONMENT

Aeolian transport processes

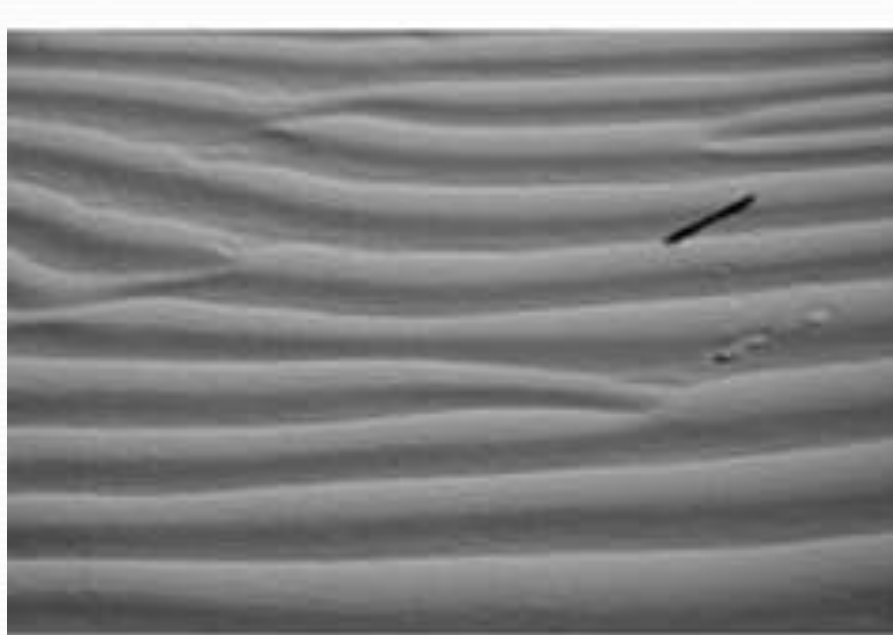
- A flow of air over a loose grain of sand exerts a lift force on the particle and with increasing velocity the force may increase to the point where the grain rolls or saltates
- The strength of the lift force is proportional to both the velocity of the flow and the density of the medium
- Water flows of only a few tens of cm a second can only cause movement of sand grains whereas much higher velocities are required for the wind to move the same grains

AEOLIAN DEPOSITS AND ENVIRONMENT

- Deposits consisting of grains **coarser** than **coarse sand** are **unlikely** to be aeolian deposits
- At high wind velocities, silt- and clay-sized particles are carried as **suspended load**

AEOLIAN DEPOSITS AND ENVIRONMENT

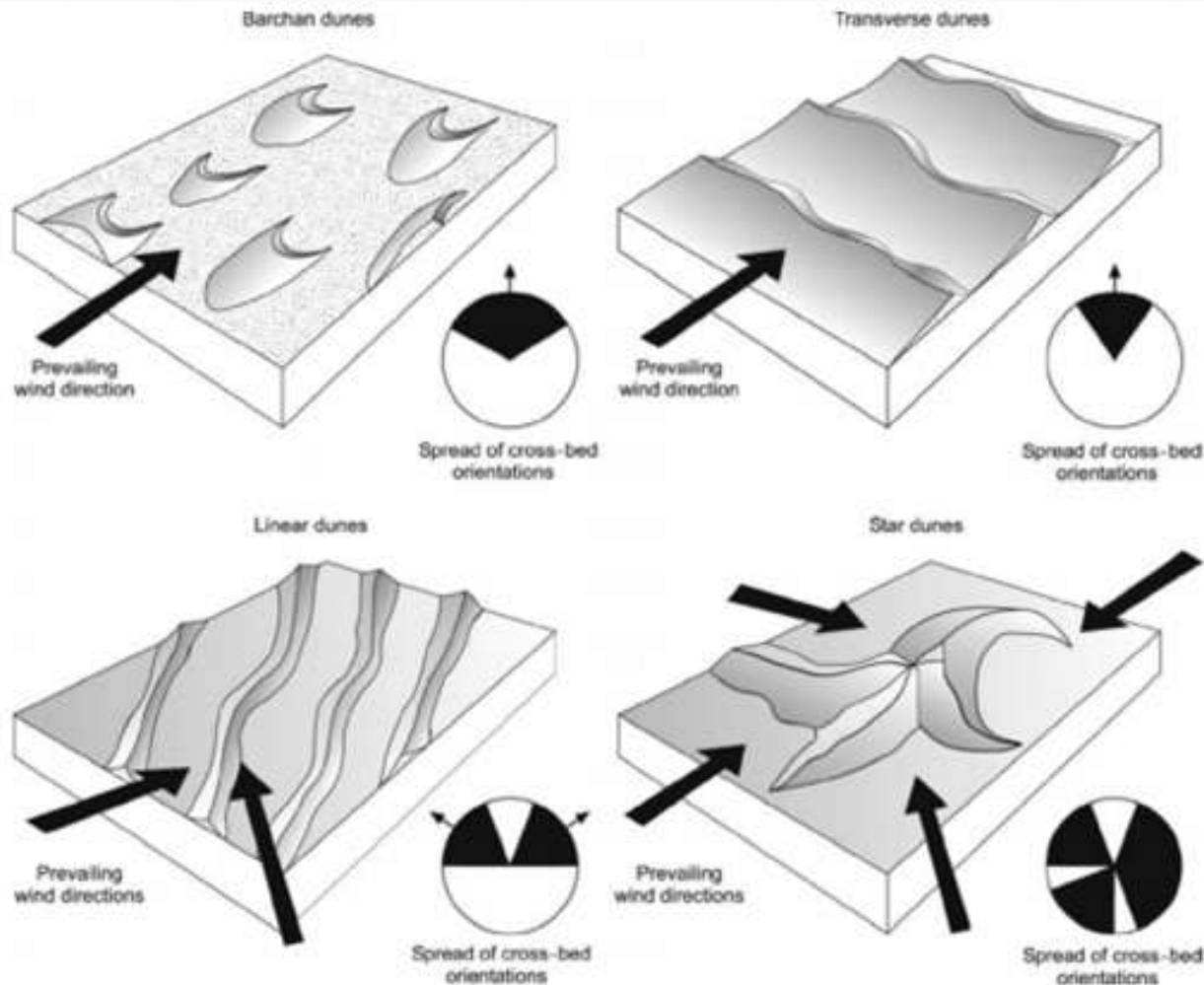
- **Aeolian Bedforms**



- **Aeolian Ripples**

AEOLIAN DEPOSITS AND ENVIRONMENT

• Aeolian Paleocurrent



AEOLIAN DEPOSITS AND ENVIRONMENT

Characteristics of aeolian deposits

- . **Lithologies** – sand and silt only
- . **Mineralogy** – mainly quartz, with rare examples of carbonate or other grains
- . **Texture** – well- to very well-sorted silt to medium sand
- . **Fossils** – rare in desert dune deposits, occasional vertebrate bones
- . **Sedimentary structures** – large-scale dune crossbedding and parallel stratification in sands
- . **Palaeocurrents** – dune orientations reconstructed from cross-bedding indicate wind direction
- . **Colour** – yellow to red due to iron hydroxides and oxides
- . **Facies associations** – occur with alluvial fans, ephemeral river and lake facies in deserts, also with beach deposits or glacial outwash facies

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- **Aeolian Environment**

